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Testing for a constant coefficient of variation in nonparametric regression by empirical processes

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Abstract In the common nonparametric regression model, we consider the problem of testing the hypothesis that the coefficient of the scale and location function is constant. The test is based on a comparison of the standardized (by a local linear estimate of the scale function) observations with their mean. We show weak convergence of a centered version of this process to a Gaussian process under the null hypothesis and the alternative and use this result to construct a test for the hypothesis of a constant coefficient of variation in the nonparametric regression model. A small simulation study is also presented to investigate the finite sample properties of the new test.

Keywords Nonparametric regression · Test for constant coefficient of variation · Empirical process